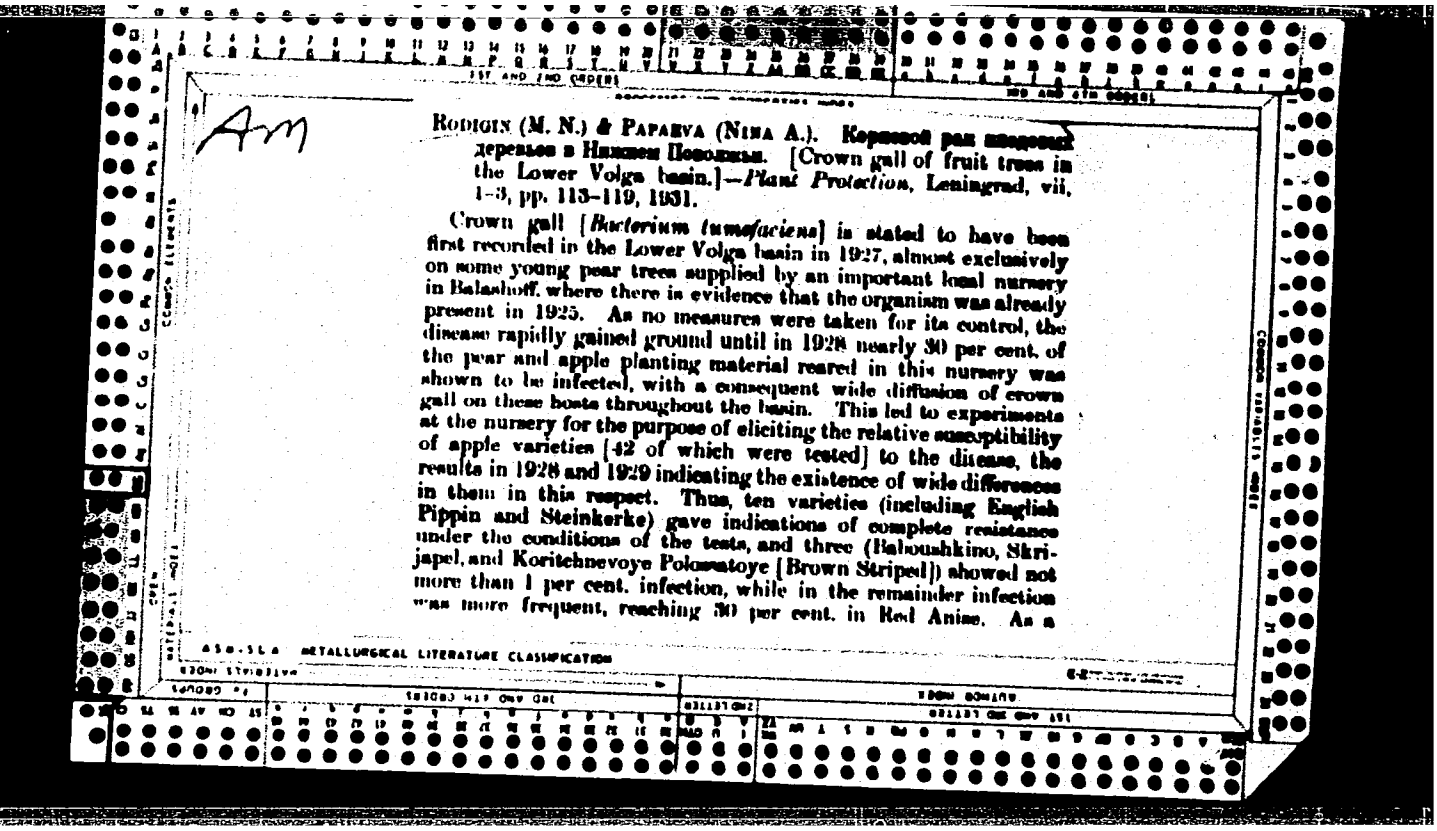


Am

RODIGIN (M. N.) & PAPAEVA (NINA A.). Корневой рак плодовых деревьев в Нижнем Поволжьи. [Crown gall of fruit trees in the Lower Volga basin.]—*Plant Protection*, Leningrad, vii, 1–3, pp. 113–119, 1931.

Crown gall [*Bacterium tumefaciens*] is stated to have been first recorded in the Lower Volga basin in 1927, almost exclusively on some young pear trees supplied by an important local nursery in Balashoff, where there is evidence that the organism was already present in 1925. As no measures were taken for its control, the disease rapidly gained ground until in 1928 nearly 30 per cent. of the pear and apple planting material reared in this nursery was shown to be infected, with a consequent wide diffusion of crown gall on these hosts throughout the basin. This led to experiments at the nursery for the purpose of eliciting the relative susceptibility of apple varieties [42 of which were tested] to the disease, the results in 1928 and 1929 indicating the existence of wide differences in them in this respect. Thus, ten varieties (including English Pippin and Steinkerke) gave indications of complete resistance under the conditions of the tests, and three (Baloushkino, Skrijapel, and Koritchnevoye Polosatoye [Brown Striped]) showed not more than 1 per cent. infection, while in the remainder infection was more frequent, reaching 30 per cent. in Red Anise. As a

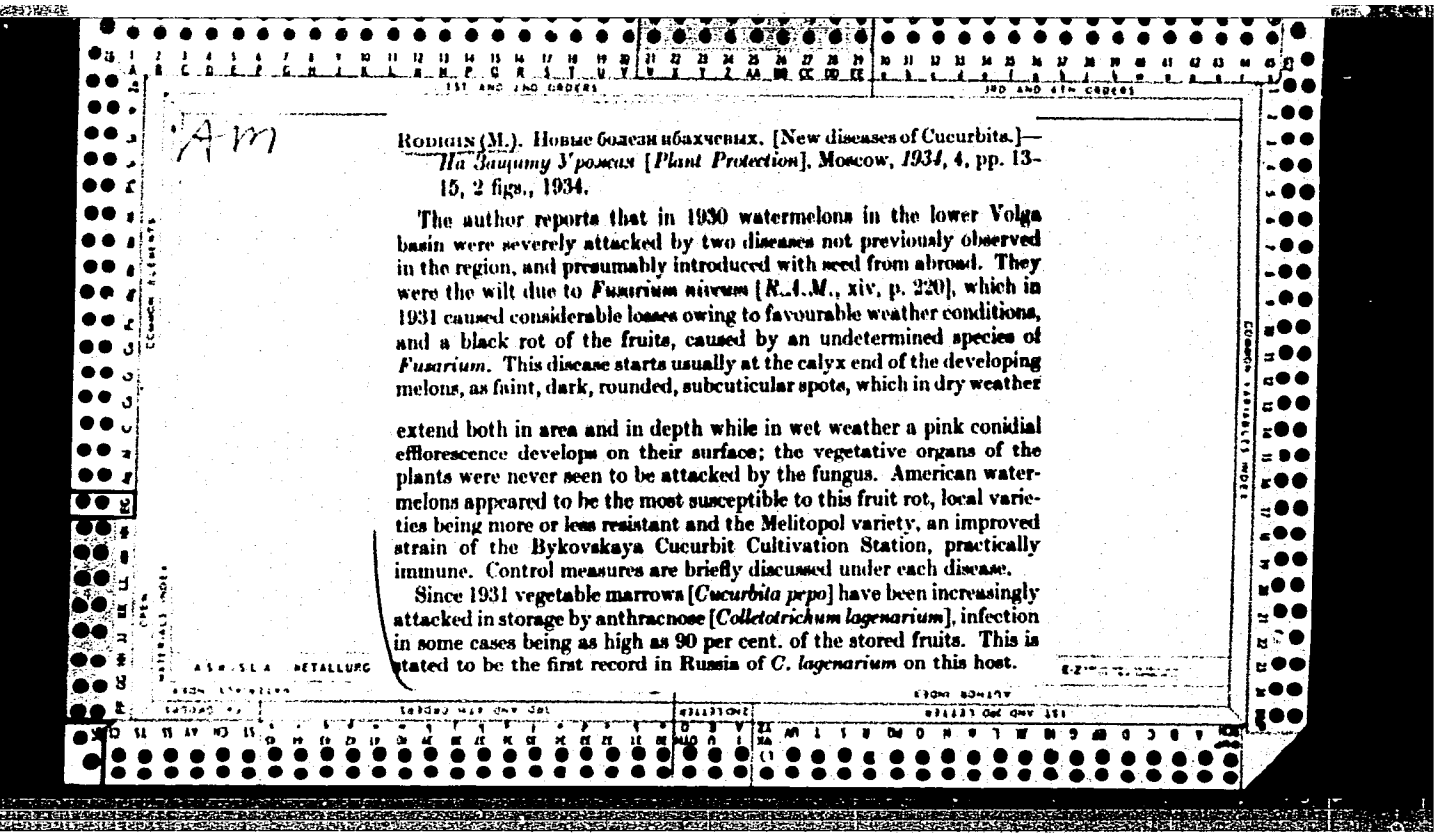
general rule, all the resistant varieties are characterized by the high acidity of their sap. The nature of the scion, in these experiments, appeared to have a decisive influence on the resistance or susceptibility of the grafted trees (all of which were worked on the same, relatively susceptible Kitayka stock), the reaction of which to infection was the same as that of the respective scions alone.

The preliminary results of further experiments [very brief details of which are given] indicated that healthy apple cuttings planted close to infected ones could develop typical crown galls in five months. The causal organism is capable of extension inside the host tissues, causing the formation of secondary tumours; infection apparently only takes place through cuts or wounds in the root system. The surgical removal of the galls and subsequent disinfection of the roots with 1 in 1,000 mercuric chloride, 1 in 300 formalin, or 1 per cent. copper sulphate solution did not give practical control. One- and two-year-old trees infected with *Bact. tumefaciens* usually develop as vigorously as uninfected ones, and occasionally show signs of stimulation of growth, but this is not maintained in the following years, and a large proportion of them die before the sixth year.

RODIGIN, M. N.

RODIGIN, M. N. "Some Data on the Test of Fungicides in Control of Sphaerotheca fulginea Poll. on Cucurbitaceae," Zashchita Rastenii, no. 2, 1932, pp. 69-74. 421 D36

So: SIRA SI-90-53, 15 Dec. 1953

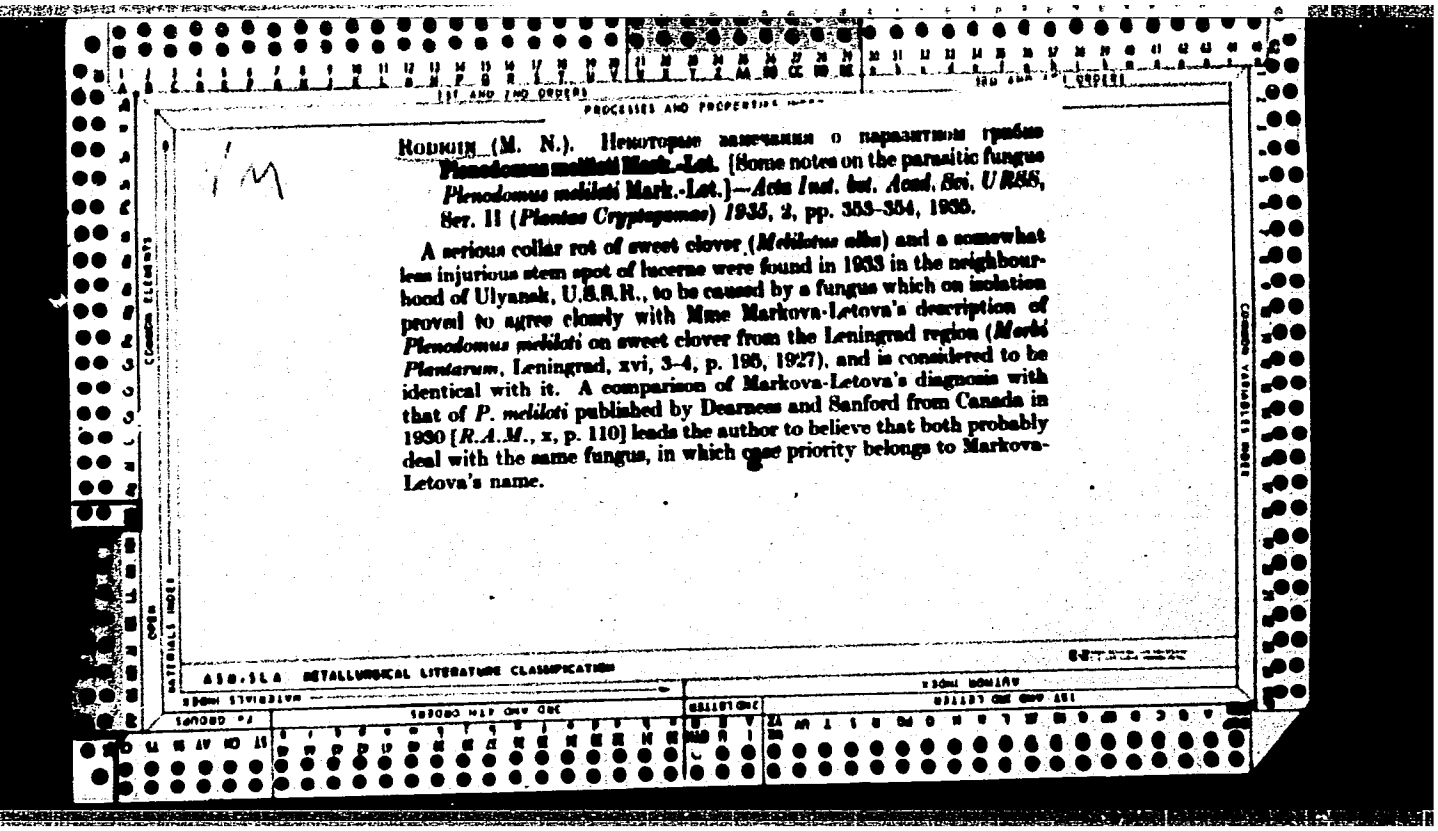


A-m

RODIGIN (M.). Новые болезни бахчевых. [New diseases of Cucurbits.]—*На Защиту Урожая* [*Plant Protection*], Moscow, *1934*, 4, pp. 13-15, 2 figs., 1934.

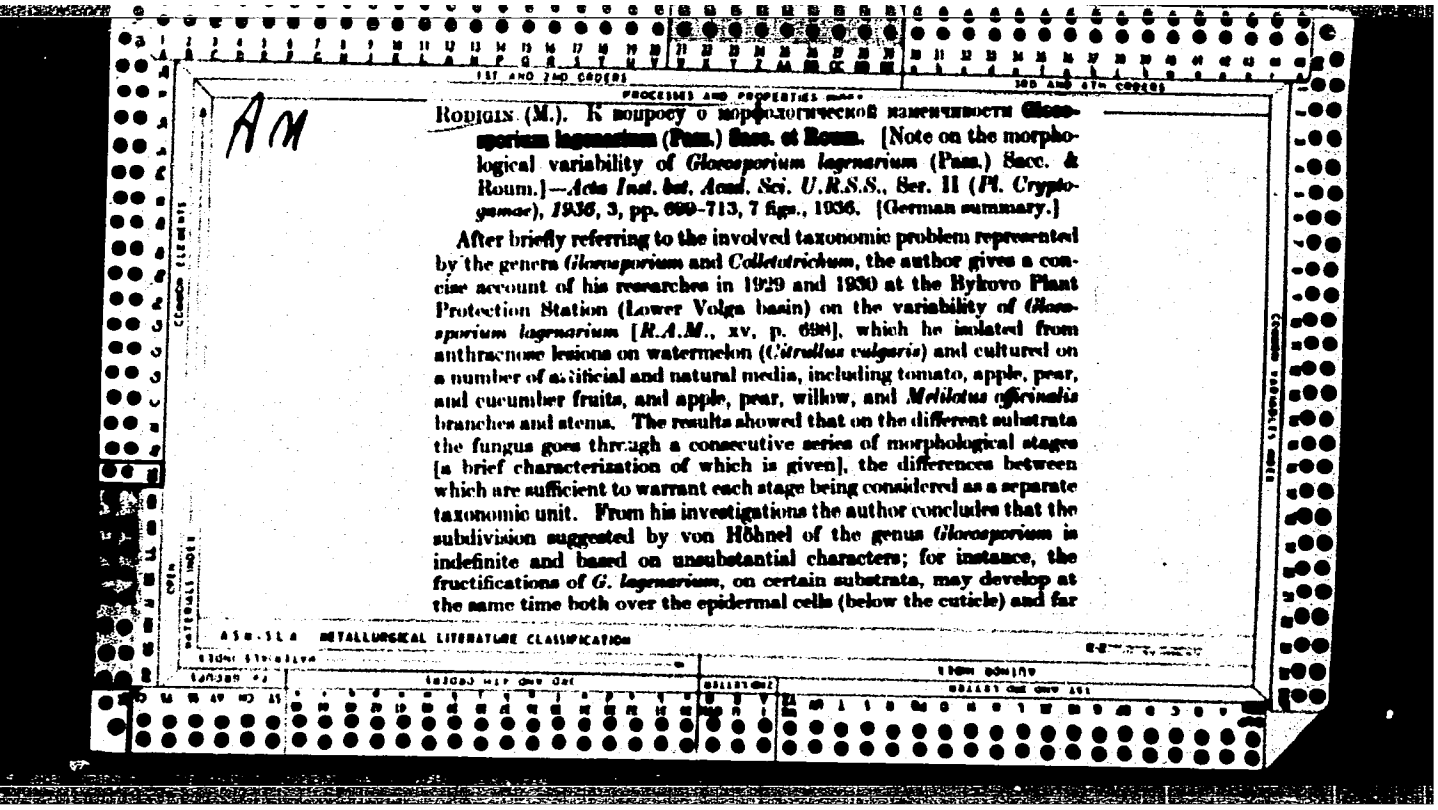
The author reports that in 1930 watermelons in the lower Volga basin were severely attacked by two diseases not previously observed in the region, and presumably introduced with seed from abroad. They were the wilt due to *Fusarium niveum* [*R.A.M.*, xiv, p. 220], which in 1931 caused considerable losses owing to favourable weather conditions, and a black rot of the fruits, caused by an undetermined species of *Fusarium*. This disease starts usually at the calyx end of the developing melons, as faint, dark, rounded, subcuticular spots, which in dry weather extend both in area and in depth while in wet weather a pink conidial efflorescence develops on their surface; the vegetative organs of the plants were never seen to be attacked by the fungus. American watermelons appeared to be the most susceptible to this fruit rot, local varieties being more or less resistant and the Melitopol variety, an improved strain of the Bykovskaya Cucurbit Cultivation Station, practically immune. Control measures are briefly discussed under each disease.

Since 1931 vegetable marrows [*Cucurbita pepo*] have been increasingly attacked in storage by anthracnose [*Colletotrichum lagenarium*], infection in some cases being as high as 90 per cent. of the stored fruits. This is stated to be the first record in Russia of *C. lagenarium* on this host.



RODIGIN (M. N.). Некоторые замечания о паразитном грибке *Pleodomus meliloti* Mark.-Let. [Some notes on the parasitic fungus *Pleodomus meliloti* Mark.-Let.]—*Acta Inst. bot. Acad. Sci. URSS*, Ser. II (*Plantae Cryptogamae*) *1935*, 2, pp. 353–354, 1935.

A serious collar rot of sweet clover (*Melilotus alba*) and a somewhat less injurious stem spot of lucerne were found in 1933 in the neighbourhood of Ulyanok, U.S.S.R., to be caused by a fungus which on isolation proved to agree closely with Mme Markova-Letova's description of *Pleodomus meliloti* on sweet clover from the Leningrad region (*Morbi Plantarum*, Leningrad, xvi, 3–4, p. 195, 1927), and is considered to be identical with it. A comparison of Markova-Letova's diagnosis with that of *P. meliloti* published by Dearness and Sanford from Canada in 1930 [*R.A.M.*, x, p. 110] leads the author to believe that both probably deal with the same fungus, in which case priority belongs to Markova-Letova's name.



AM

Rodigin (M.). К вопросу о морфологической изменчивости **Glaeosporium lagenarium (Pass.) Sacc. et Roum.** [Note on the morphological variability of *Glaeosporium lagenarium* (Pass.) Sacc. & Roum.]—*Acta Inst. bot. Acad. Sci. U.R.S.S.*, Ser. II (*Pl. Cryptogamae*), *1936*, 3, pp. 699–713, 7 figs., 1936. [German summary.]

After briefly referring to the involved taxonomic problem represented by the genera *Glaeosporium* and *Colletotrichum*, the author gives a concise account of his researches in 1929 and 1930 at the Bykovo Plant Protection Station (Lower Volga basin) on the variability of *Glaeosporium lagenarium* [*R.A.M.*, xv, p. 698], which he isolated from anthracnose lesions on watermelon (*Citrullus vulgaris*) and cultured on a number of artificial and natural media, including tomato, apple, pear, and cucumber fruits, and apple, pear, willow, and *Melilotus officinalis* branches and stems. The results showed that on the different substrata the fungus goes through a consecutive series of morphological stages [a brief characterization of which is given], the differences between which are sufficient to warrant each stage being considered as a separate taxonomic unit. From his investigations the author concludes that the subdivision suggested by von Höhnel of the genus *Glaeosporium* is indefinite and based on unsubstantial characters; for instance, the fructifications of *G. lagenarium*, on certain substrata, may develop at the same time both over the epidermal cells (below the cuticle) and far

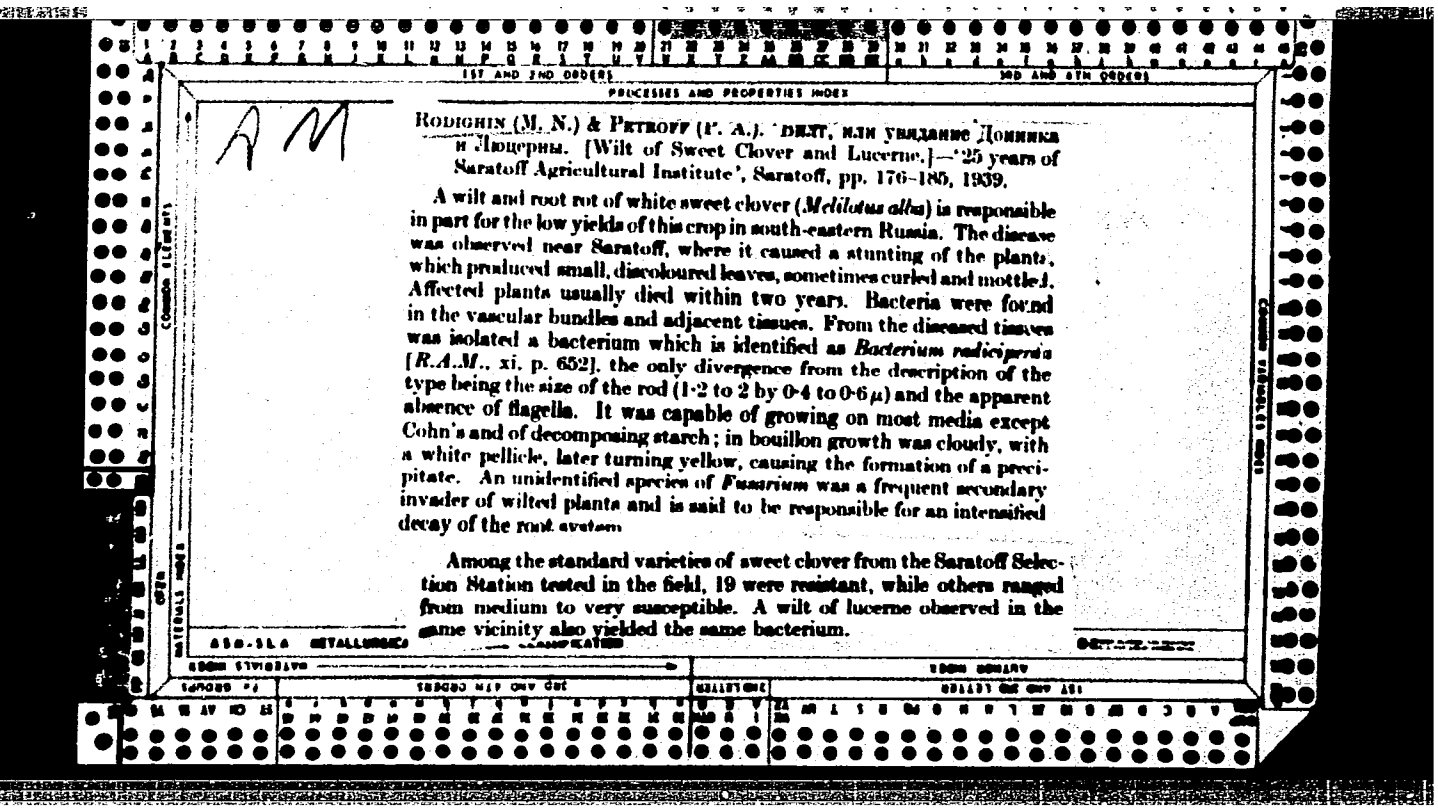
below them. Jaczewski's genus *Pseudoglocosporium* is only a stage in the life-cycle of certain species, and cannot be retained as a distinct genus. This is demonstrated by the fact that on certain media *G. lagenarium* produces a well-developed pseudopycnidial wall. The formation or non-formation of setae in the cultures appeared to be independent of whether the isolation was made from a strain naturally abundantly provided with, or entirely devoid of, setae, and this shows that the genera *Gloeosporium* and *Colletotrichum* cannot be distinguished by the presence or absence of these organs. When cultured on the rind of the watermelon variety 'Belokory belosemenny' [white-rinded white-seeded], *G. lagenarium* produced an abundance of gelatinous tendrils of spores which emerged from cracks in the surface; this is thought to be the first recorded observation of such tendrils in the genus *Gloeosporium*, and indicates a close relationship to the genus *Naemospora*.

On the basis of these investigations the author considers that current views on the constancy of genera and species, as taxonomic units, must be revised in the sense that these units are essentially variable and may in one way or another give rise to new forms.

RODIGIN, M. N.

M. N. Rodigin "Virus Diseases of Cucurbitaceae and Other Plants in the Volga Region and Organization of Virological Work," in Virus Diseases of Plants, Collection 2, Publishing Affiliate of the All Union Institute of Plant Protection, Moscow, 1938, pp. 233-234. 464.32 V96 v.2

SO: Sira Si 90-53, 15 Dec 1953

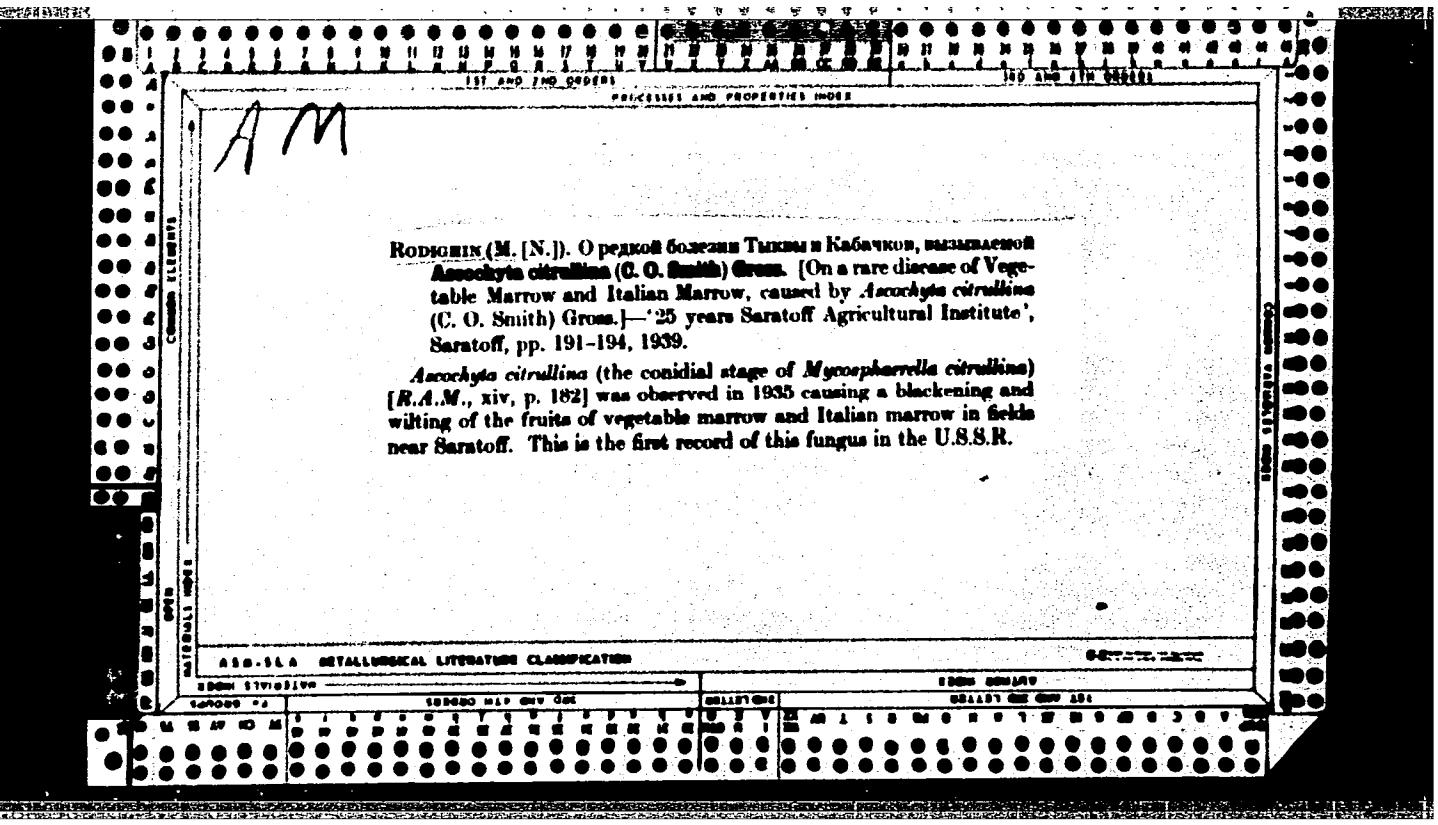


PROCESSES AND PROPERTIES INDEX

RODIGHIN (M. N.) & PETROFF (P. A.). ВЯНУТ, или увядание Донника и Люцерны. [Wilt of Sweet Clover and Lucerne.]—'25 years of Saratoff Agricultural Institute', Saratoff, pp. 176–185, 1939.

A wilt and root rot of white sweet clover (*Melilotus alba*) is responsible in part for the low yields of this crop in south-eastern Russia. The disease was observed near Saratoff, where it caused a stunting of the plants, which produced small, discoloured leaves, sometimes curled and mottled. Affected plants usually died within two years. Bacteria were found in the vascular bundles and adjacent tissues. From the diseased tissues was isolated a bacterium which is identified as *Bacterium radicipercia* [*R.A.M.*, xi, p. 652], the only divergence from the description of the type being the size of the rod (1·2 to 2 by 0·4 to 0·6 μ) and the apparent absence of flagella. It was capable of growing on most media except Cohn's and of decomposing starch; in bouillon growth was cloudy, with a white pellicle, later turning yellow, causing the formation of a precipitate. An unidentified species of *Fusarium* was a frequent secondary invader of wilted plants and is said to be responsible for an intensified decay of the root system.

Among the standard varieties of sweet clover from the Saratoff Selection Station tested in the field, 19 were resistant, while others ranged from medium to very susceptible. A wilt of lucerne observed in the same vicinity also yielded the same bacterium.



RODIGHIN (M. [N.]). О редкой болезни Тыквы и Кабачков, вызываемой **Ascochyta citrullina (C. O. Smith) Gross.** [On a rare disease of Vegetable Marrow and Italian Marrow, caused by *Ascochyta citrullina* (C. O. Smith) Gross.]—'25 years Saratoff Agricultural Institute', Saratoff, pp. 191–194, 1939.

*Ascochyta citrullina* (the conidial stage of *Mycosphaerella citrullina*) [*R.A.M.*, xiv, p. 182] was observed in 1935 causing a blackening and wilting of the fruits of vegetable marrow and Italian marrow in fields near Saratoff. This is the first record of this fungus in the U.S.S.R.

P; A1

Rodigin (M. N.). Видовой состав домовых грибов в Башкирской АССР. [An account of house fungi in the Bashkir Autonomous Soviet Socialistic Republic.] *Trud. Bashkirsk. Selsk. Xozd.* [*Bull. Bashkir agric. Inst.*], v, 2, pp. 35-37, 1946.

In 1939 the damage caused to wooden buiklings in Bashkir (especially in Ufa) assumed alarming proportions and the Phytopathological and Entomological Agricultural Institute in Bashkir examined many of the buildings and made numerous wood analyses. From 1939 to 1944 the following wood-attacking fungi were identified: *Merulius lacrymans* (widespread) [*R.A.M.*, xxvi, p. 370], *Poria vaporaria* (very common) [loc. cit.], *Coniophora cerebella* [*C. puteana*: loc. cit.], *P. vaillantii* [ibid., xxv, p. 20], *Paxillus acheruntius*, *Peniophora gigantea*, *Lenzites sepiaria* [loc. cit.], *Corticium seriale*, *Trametes* [*Fomes*] *pini*, and *Ceratostomella pilifera*.

RODIGIN, M. N.

M. N. Rodigin, "Anthracnose of Melon Crops and Methods of Control," Sad i Ogorod, no. 4, 1948, pp. 60-63. 80 Sal3

SO: Sira Si 90-53, 15 Dec 1953

PA 18/49T51

USSR/Medicine - Plants, Parasites Sep/Oct 48
Medicine - Fungi

"Air Currents and How They Spread the Gloeosporium Lagenarium (Pass) Sacc. et Roum," M. N. Rodigin, Bashkir Agr Inst, Ufa, 6½ pp

"Mikrobiologiya" Vol XVII, No 5

Parasitic fungus Gloeosporium lagenarium, which causes anthracnose, is incapable of detaching the conidium from its tacky mass of spore clusters. Experiments on catching conidia on aeroscopes and slides show that they are propagated by the wind. To this is due so-called "dry rust" on upper surfaces 18/49T51

USSR/Medicine - Plants, Parasites(Contd) Sep/Oct 48

of watermelons. "Dry rust" occurs when conidia are deposited by dew, and "wet rust" when they are deposited by rain. Sources which ensure anthracnose conidia passing into the air are fungus sclerotia which have spent the winter in infected plant remnants. Submitted 13 Mar 48.

18/49T51

RODIGIN, M. N.

FDB

RODIGIN, M. N.

M. N. Rodigin, "On the Polymorphism of Gloeosporium lagenarium (Pass.) Sacc. et Roum.," Doklady Akademii Nauk SSSR, vol.59, Feb. 1, 1948, pp. 767-769. 511 P444A

SO: SiraSi 90-53, 15 Dec 1953

RODIGIN, M. N.

FA 43T58

USSR/Medicine - Fungi Feb 1948

"The Problem of Polymorphism in Gloeosporium Lagenarium (Pass.) Sacc. et Roum," M. N. Rodigin, Bashkir Agr Inst, Ufa, 1½ pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 4

Lists eight types of polymorphic fungi, possessing forms differing completely from each other. Describes principal characteristics. Submitted by Academician B. L. Isachenko, 24 Nov 1947.

FDB 43T58

RODIGIN, M.N.

Changes in the virulence of Gloeosporium lagenarium (Pass.) Sacc et Roum. as a function of the duration of growth and of the number of inoculation in organic substrata. Dokl. AN SSSR 60 no.5:895-896 My '48. (MLRA 10:8)

1. Bashkirskiy sel'skokhozyaystvennyy institut. Predstavleno akademikom N.A. Maksimovym.

(Fungi)

RODIGIN, M. N.

M. N. Rodigin "Change of Virulence of Gloeosporium lagenarium (Pass.) Sacc. et Roum. in Relation to Duration of Its Growth and the Number of Transfers to Organic Culture Media," Doklady Akademii "auk SSSR, vol. 60, May 11, 1948, pp. 895-896. 511 P444A

SO: Sira Si 90-53, 15 Dec 1953

RODIGIN, M.N.

Rodigin (M. N.) & Gainullina (Mme E. G.). Влияние тепловой обработки семян на сортовую устойчивость Пр/са к пыльной головне. [The effect of heat treatment of seed on varietal resistance of Millet to loose smut.]—Земледелие [*Zemledelie, Moscow*], 2, 3, pp. 105–106, 1954.

In recent experiments in the U.S.S.R. heat treatment of millet [*Panicum miliaceum*] seed (hot air at 40° C. or hot water at 100° followed by cold water) increased both resistance to loose smut [*Sphacelotheca destruens*: C.M.I. map No. 219] and yields. In the varieties Dolinskoe 86 and Omskoe 38 infection was reduced by 46·8 and 27·9 per cent., respectively, by hot water treatment and in the former the yield was increased by 29·2 (hot air) and 42·4 (hot water) per cent.

RODIGIN, M.N.(Moscow)

Internal therapy as a possible method of preventing and treating plant diseases. Usp.sovr.biol.40 no.1:78-87 Jl-Ag '55.(MLRA 8:10)
(BOTANY--PATHOLOGY) (PLANTS--NUTRITION)

RODIGIN, M.N.

Rare fungus Phyllactinia roboris(Gachet) Blüm.on the leaves of Quercus robur L. Bot.mat.Otd.spor.rast. 11:103-104 Ja '56.
(Ufa District--Mildew)

RODIGIN, M.N.

New species of fungi from the Bashkir A.S.S.R. Bot.mat.Otd. spor.rast. 11:164-166 Ja '56. (MLRA 9:11)
(Ufa District--Fungi)

RODIGIN, M.N., professor.

Phytoncides in agriculture. Priroda 45 no.6:102-103 Je '56.

1. Saratovskiy sel'skokhozyaystvennyy institut.
(Phytonicides)

RODIGIN, M.N.

Mycology in the Chinese People's Republic. Bot.zhur. 44 no.10:1515-1521 O '59. (MIRA 13:4)
(China--Mycologinal research)

RODIGIN, M.N.; ZHURAVLEVA, L.G.

Conidial stage of Pseudopeziza medicaginis (Lib.) Sacc.
Bot.mat.Otd.spor.rast. 12:211-213 Ja '59. (MIRA 12:12)
(Ascomycetes) (Alfalfa--Diseases and pests)

RODIGIN, M.N.

Development of mycology and phytopathology in the Volga Valley and in the Southern Urals. Trudy VIZR no.23:265-271 '64. (MIRA 19:2)

RODIGIN, M.N., doktor biolog.nauk; TRUNOV, G.A., kand.sel'skokhoz.nauk

Internal therapy of plants. Zashch. rast. ot vred. i bol. 8 no. 11:17-19 N '63. (MIRA 17:3)

RODIGIN, M. N., doktor biolog. nauk, prof.

"Acta phytopathologica sinica". Zashch. rast. ot vred. i bol. 5 no.11:58-59 N '60. (MIRA 16:1)

1. Saratovskiy sel'skokhozyaystvennyy institut.

(China—Plant diseases—Periodicals)

RODIGIN, M.N.; MINAYEVA, T.I.

Effect of zinc in increasing the resistance of various cucumber varieties to bacteriosis. Dokl. AN SSSR 146 no.2:478-479 S '62. (MIRA 15:9)

1. Saratovskiy sel'skokhozyaystvennyy institut. Predstavleno akademikom A.L. Kursanovym.

(Plants, Effect of zinc on)
(Cucumbers—Disease and pest resistance) (Pseudomonas lachrymans)

RODIGIN, M.N., prof.doktor biologicheskikh nauk; KRASNOVA, T.A.; GRESHNOVA, V.N.

Trace elements in the control of wheat diseases. Zemledelie 23 no.4:81-82 Ap '61. (MIRA 14:3)

1. Saratovskiy sel'skokhozyaystvennyy institut.
(Wheat—Diseases and pests)
(Trace elements)

PLYUSNIN, V.G.; RODIGIN, N.M.

Regularities in the substitution of hydrogen atoms in the benzene nucleus by alkyl groups [with summary in English]. Zhur.fiz.khim. 31 no.9:2066-2073 S '57. (MIRA 11:1)

1.Akademiya nauk SSSR Ural'skiy filial, Sverdlovsk.
(Alkylation) (Benzene)

BABIN, Ye.P.; PLYUSNIN, V.G.; ZELENTSOVA, M.I.; RODIGIN, N.M.

Reversible reactions in the alkylation of isopropylbenzene by propylene. Izv.Sib.AN SSSR no.11:57-61 '59. (MIRA 13:4)

1. Ural'skiy filial AN SSSR.
(Cumene) (Alkylation) (Propylene)

BABIN, Ye.P.; PLYUSNIN, V.G.; NASAKINA, M.I.; RODIGIN, N.M.

Alkylation of diisopropylbenzene by propylene in the presence of aluminum chloride. Izv.Sib.otd.AN SSSR no.12:59-64 '59. (MIRA 13:5)

1. Institut obshchey i neorganicheskoy khimii im.N.S.Kurnakova AN SSSR i Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR.

(Benzene) (Propylene) (Alkyiation)

RODIGIN, Nikolay Mikhaylovich; RODIGINA, Emiliya Nikolayevna; FEDOROV, G.V., otv.red.; BANKVITSER, A.L., red.izd-va; LEBEDEVA, A.A., tekhn.red.

[Chemical step reactions; mathematical analysis and computations] Posledovatel'nye khimicheskie reaktsii; matematicheskii analiz i raschet. Moskva, Izd-vo Akad.nauk SSSR, 1960. 137 p. (MIRA 14:2)

(Chemical reaction, Rate of)

BABIN, Ye.P.; PLYUSNIN, V.G.; RODIGIN, N.M.; ZELENTSOVA, M.I.

Reversible sequential reactions in the propylation of diisopropylbenzene with aluminum chloride. Izv.Sib.otd.AN SSSR no.5:66-72 '60. (MIRA 13:7)

1. Ural'skiy filial AN SSSR.
(Benzene) (Propylation)

68816

5.3200

S/076/60/034/02/003/044
B010/B015

AUTHORS: Plyusnin, V. G., Babin, Ye. P., Nasakina, M. I., Rodigin, N. M.

TITLE: Laws of the Substitution of Hydrogen Atoms in the Benzene Nucleus by Alkyl Groups. VII. Ratio Between the Velocity Constants of the Formation of Isopropyl Benzene and Equations for the Composition of the Products of Benzene Alkylation by Propylene in the Presence of Aluminum Chloride

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 2, pp 267-271 (USSR)

ABSTRACT: In previous papers (Refs 1-3) it was found that the benzene alkylation with propylene in the presence of hydrogen fluoride (as a catalyst) leads to a successive formation of mono-, di-, tri-, and tetraisopropyl benzene, with the reaction rate constants occurring in the following ratio: $k_1 : k_2 : k_3 : k_4 = 1 : 0.8 : 0.32 : 0.16$. In the present paper, this reaction was investigated in the presence of aluminum chloride (instead of hydrogen fluoride). Alkylation took place at 60 ± 0.2°. Propylene was passed through a mixture of 0.03 mol of aluminum chloride per 1 mol of benzene at a constant velocity (about 300-330 l/h per 1 kg of benzene). Tables show the experimental results obtained (Tables 1,2). According to results of experiments and calculation, the ratio of the reaction

Card 1/2

68846

Laws of the Substitution of Hydrogen Atoms in the Benzene Nucleus by Alkyl Groups. VII. Ratio Between the Velocity Constants of the Formation of Isopropyl Benzene and Equations for the Composition of the Products of Benzene Alkylation by Propylene in the Presence of Aluminum Chloride

S/076/60/034/02/003/044
B010/B015

rate constants is as follows: $k_1 : k_2 : k_3 : k_4 = 1 : 0.58 : 0.24 : 0.015$. Tetraisopropyl benzene is the end product of benzene alkylation. The equations for the composition of the system investigated were calculated for various molar ratios of propylene : benzene. With respect to the industrial production of monoisopropyl benzene it is found that less raw material is consumed if aluminum chloride is used as a catalyst instead of hydrogen fluoride, and that the reaction proceeds irreversibly in the presence of hydrogen fluoride, whereas it is reversible in the presence of aluminum chloride. There are 2 figures, 2 tables, and 15 references, 12 of which are Soviet.

ASSOCIATION: Ural'skiy filial Akademii nauk SSSR (Ural Branch of the Academy of Sciences, USSR)

SUBMITTED: September 25, 1957

Card 2/2

RODIGIN, N.M.; BABIN, Ye.P.; PLYUSNIN, V.G. (Sverdlovsk)

Correlations in the substitution of hydrogen atoms by alkyl groups in the benzene ring. Zhur.fiz.khim. 34 no.5:966-972 My '60. (MIRA 13:7)

1. Ural'skiy filial AN SSSR, Sverdlovsk.
(Benzene) (Alkylation)

S/076/60/034/007/010/042/XX
B004/B068

AUTHORS: Babin, Ye. P., Plyusnin, V. G., Nasakina, M. I., and Rodigin, N. M.

TITLE: Laws Valid for the Substitution of Alkyl Groups for Hydrogen Atoms on the Benzene Nucleus. X. Relation Between the Rate Constants of the Formation of Isopropyl Benzene, and Equations for the Composition of the Alkylation Products of Isopropyl Benzene by Means of Propylene in the Presence of Aluminum Chloride

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 7, pp. 1389-1394

TEXT: In a previous work (Ref. 1), the authors pointed out that the alkylation of benzene with propylene is a consecutive reversible reaction. Reverse reactions take place in the first, second, and fourth stages of the complete reaction. From this result, the conclusion is drawn that benzene must form as the dealkylation product when the alkylation of isopropyl benzene is carried out with propylene. The aim of this paper is to

Laws Valid for the Substitution of Alkyl Groups for Hydrogen Atoms on the Benzene Nucleus. X. Relation Between the Rate Constants of the Formation of Isopropyl Benzene, and Equations for the Composition of the Alkylation Products of Isopropyl Benzene by Means of Propylene in the Presence of Aluminum Chloride

S/076/60/034/007/010/042/XX
B001/B068

determine the relation between the rate constants of the direct and the reverse reaction, as well as to find out whether the relation between the alkylation constants of benzene corresponds to the relation between the alkylation constants of isopropyl benzene. For this reason, the alkylation of isopropyl benzene was carried out in the presence of $AlCl_3$ with dry propylene in nitrogen. The flow rate of propylene varied between 200 and 250 l/h per kg of isopropyl benzene. The reaction products obtained were rectified. The composition of the fractions with different propylene - isopropyl benzene ratios is given in two tables. Analyses were performed by I. A. Alekseyeva and G. A. Semerneva. It may be seen from these data that at 60°C not only the formation of di-, tri-, and tetraisopropyl benzene but also of benzene takes place. The reverse reaction in the first stage was thereby confirmed. The alkylation reaction is represented by the following scheme:

Card 2/6

Laws Valid for the Substitution of Alkyl Groups for Hydrogen Atoms on the Benzene Nucleus. X. Relation Between the Rate Constants of the Formation of Isopropyl Benzene, and Equations for the Composition of the Alkylation Products of Isopropyl Benzene by Means of Propylene in the Presence of Aluminum Chloride

S/076/60/034/007/010/042/XX
B004/B058

$C_0 \underset{\beta_1}{\overset{k_1}{\rightleftharpoons}} C_1 \xrightarrow{k_2'} C_2 \xrightarrow{k_3} C_3 \xrightarrow{k_4'} C_4$ (1). $k_i$ are the direct-reaction constants; i = 1, 2, 3, 4; $\beta_1$ is the reverse-reaction constant. Since the dealkylation of di- and tetraisopropyl benzene has not been considered, $k_2'$ and $k_4'$ are " summational constants" which refer both to the direct and reverse reaction. With $k_3$, the dealkylation of triisopropyl benzene may be neglected. From an equation given in Ref. 13 for consecutive reversible reactions, the following ratios were found: $\beta_1 : k_1 : k_2' : k_3 : k_4' = 0.38 : 1 : 0.20 : 0.065 : 0.003$. The equations for the composition of the alkylation products are given as: $c_0 = 38[0.769 \exp(-0.14kt) - 0.769 \exp(-1.44kt)]$;

$c_1 = 66.16 \exp(-0.14kt) - 33.85 \exp(-1.44kt)$;

Card 3/6

$c_2 = 20\left[9.066 \exp(-0.065kt) - 8.820 \exp(-0.14kt) + 0.246 \exp(-1.44kt)\right];$

$c_3 = 1.3\left[80.38\exp(-0.003kt) - 143.9\exp(-0.065kt) + 64.38 \exp(-0.14kt) - 0.171\exp(-1.44kt)\right];$

$c_4 = 100 - \sum_{c_o}^{c_3} c_i$ (4). Fig. 2 shows the proportion by weight of the components with different initial molar ratios n. It is thus shown that there is good agreement between values calculated from (4) and those found experimentally. These values are compared with those established for the alkylation of benzene (data given in Refs. 11 and 14). The relation between the consecutive reversible reaction rate constants for the alkylation of isopropyl benzene differ only little from the relation between the consecutive alkylation rate constants for benzene with propylene under comparable experimental conditions. There are 2 figures, 3 tables, and

Laws Valid for the Substitution of Alkyl Groups for Hydrogen Atoms on the Benzene Nucleus. X. Relation Between the Rate Constants of the Formation of Isopropyl Benzene, and Equations for the Composition of the Alkylation Products of Isopropyl Benzene by Means of Propylene in the Presence of Aluminum Chloride

S/076/60/034/007/010/042/XX
B004/[illegible]68

14 references: 11 Soviet and 3 US.

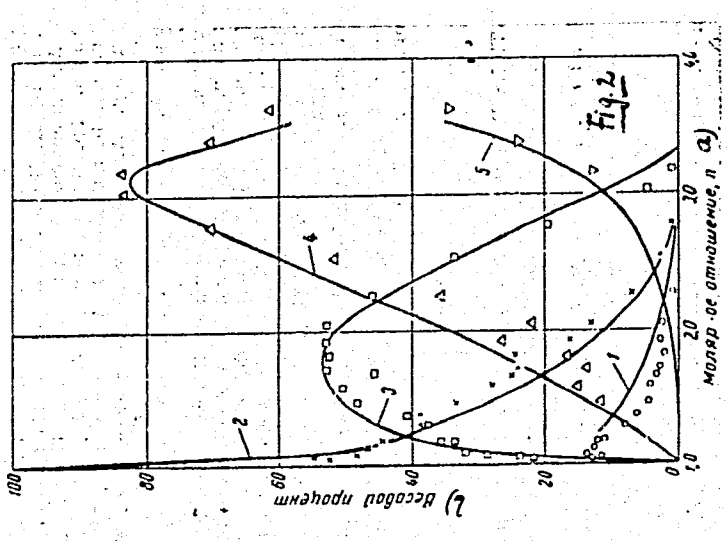
ASSOCIATION: Ural'skiy filial Akademii nauk SSSR, Institut khimii Sverdlovsk
(Ural Branch of the Academy of Sciences USSR, Institute of Chemistry, Sverdlovsk)

SUBMITTED: April 25, 1957

Text to Fig. 2: 1: Benzene; 2: Isopropyl Benzene; 3: Diisopropyl Benzene; 4: Triisopropyl Benzene; 5: Tetraisopropyl Benzene; a) Molar Ratio n; b) Percent by Weight.

Card 5/6

S/076/60/034/007/010/042/XX
B004/B068




Card 6/6

RODIGIN, N. M.

AUTHORS: Rabin, Ye. P., Plyusnin, V. G., Rodigin, N. M.

B/076/60/034/008/019/029/XX
B015/B065

TITLE: Rules of Substitution of Hydrogen Atoms in the Benzene Ring by Alkyl Groups. XI. Ratio Between the Constants of the Rate of Formation of Isopropyl Benzenes and the Equations for the Composition of the Alkylation Products of Diisopropyl Benzene With Propylene in the Presence of Aluminum Chloride

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1960, Vol. 34, No. 8, pp. 1671 - 1676

TEXT: The authors have shown in Ref.1 that the alkylation of benzene with propylene in the presence of aluminum chloride is a consecutive four-stage reaction, of which the first, the second, and the fourth are reversible. The reversibility of the first stage was demonstrated by the alkylation of monoisopropyl benzene with propylene in the presence of aluminum chloride. The experiments were performed at 60°C (Ref.2). To study the behavior of diisopropyl benzene under equal conditions, the authors

Card 1/4

alkylated this compound with propylene at 60°C, and added 0.01 mole of $AlCl_3$ per mole of diisopropyl benzene. They used a diisopropyl fraction composed of 70% m-isomer and 30% p-isomer ($d_4^{20}$ - 0.8505; $n_D^{20}$ - 1.4998. The fraction boiled between 198° and 212°C. The alkylation was carried out in a three-necked flask with a reflux condenser and a stirrer. The average flow rate of propylene was 150 l/h per kg of alkyl benzene. The alkylation product was distilled, and it was found that alkylation is a reversible, consecutive reaction since at low molar ratios, monoisopropyl benzene is formed as a dealkylation product of diisopropyl benzene. The alkylation reaction follows the scheme

$$c_1 \underset{k_1'}{\overset{k_1}{\rightleftarrows}} c_2 \underset{k_2'}{\overset{k_2}{\rightleftarrows}} c_3 \underset{k_3'}{\overset{k_3}{\rightleftarrows}} c_4 \quad (1).$$ This is in accordance with the experiment since the reaction $c_0 \rightleftarrows c_1 \rightleftarrows c_2 \rightleftarrows c_3 \rightleftarrows c_4$ actually takes place. $k_2$ and $k_3$

Card 2/4

are constants referring to the direct alkylation reaction; $k_1'$ is a generalized rate constant of the direct and reversible reaction, whereas the reversible dealkylation reaction of diisopropyl benzene has the rate constant $\beta_2$. The following ratios were found for these constants:

$\beta_2 : k_2 : k_1' : k_1' = 0.14 : 1 : 0.029 : 0.0015$, wherefrom the equations for the composition of the system were derived:

$c_1 = 14.0\,(0.894\,\exp(-0.025\,kt) - 0.894\,\exp(-1.435\,kt))^2$

$c_2 = 87.15\,\exp(-0.025\,kt) - 12.82\,\exp(-1.435\,kt)]$

$c_3 = 2.9\,[56.89\,\exp(-0.0015\,kt) - 56.78\,\exp(-0.025\,kt)$

$+ 0.112\,\exp(-1.435\,kt)]$

$c_4 = 100 - \sum_0^3 c_i$ - It is shown that the equations for the composition of

Card 3/4

the system benzene-propylene and monoisopropyl benzene-propylene may be used to calculate the alkylation of diisopropyl benzene with propylene if the monoisopropyl benzene disappears from the system. The ratios obtained for the rate constants of the systems considered were similar. The new value of the ratio between the rate constants of the formation of isopropyl benzene shows that the reactivity of isopropyl benzene in the alkylation reaction is 2.24 times higher than that of benzene. The reactivity of diisopropyl benzene is very low as compared to that of benzene. There are 1 figure, 4 tables, and 5 Soviet references.

ASSOCIATION: Akademiya nauk SSSR Ural'skiy filial Institut khimii (Ural Branch of the Academy of Sciences USSR, Institute of Chemistry)

SUBMITTED: March 24, 1958

Card 4/4

RABIN, Ye.P; PLYUSNIN, V.G.; NASAKINA, M.I.; RODIGIN, N.M.

Certain correlations in the substitution of hydrogen atoms by alkyl groups in the benzene nucleus. Part 11: Relation between the rate constants of formation of isopropylbenzenes and the equation expressing the composition of the products resulting from the alkylation of diisopropylbenzene by propylene in the presence of aluminum chloride. Zhur. fiz. khim. 34 no.8:1671-1676 Ag '60. (MIRA 13:9)

1. Akademiya nauk SSSR, Ural'skiy filial, Institut khimii.
(Benzene) (Propene)

VDOVIN, Yu.A.; VLASOV, V.V.; ZAYSEPIN, N.N.; KOROBEYNIKOVA, I.Ye.; MIKHEYEV, M.N.; RODIGIN, N.M.; TOMILOV, G.S.; SHTURKIN, D.A.; YANUS, R.I.

Discussion on nondestructive testing methods. Defektoskopiia no.1:90 '65. (MIRA 18:6)

S/0126/64/017/002/0208/0211

ACCESSION NR: AP4017352

AUTHORS: Rodigin, N. M.; Korobeynikova, I. Ye.

TITLE: A question concerning the use of the eddy currents method for selective measurement of variables of a ferromagnetic plate

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 2, 1964, 208-211

TOPIC TAGS: electromotive force, straightaway measurement coil, differential wiring scheme, electromagnetic property, ferromagnetic plate, harmonic composition, proportional relationship

ABSTRACT: The principles of electromotive force (e.m.f) change with the change of electromagnetic properties and the geometry of the plate were studied in differentially wired "straightaway" type measuring coils. The feasibility of selective measurements of varying individual parameters of the plate was proven. The following conditions were imposed: 2) the plate was of infinite length and of a width greatly in excess of the thickness; b) the plate had homogeneous electroconductivity and a nonlinear dependence of the magnetic induction B' on the magnetic field intensity H (H ≠ 0 B' is constant; at H = 0 B' is reversed). The energy was assumed to enter the plate from the surface and the electromagnetic

Card 1/3

ACCESSION NR: AP4017352

wave to penetrate to less than half the thickness. The theory of V. K. Arkad'yev (Sb. Prakticheskiye problemy* elektromagnetizma, Izd. AN SSSR, 1939, p. 19) and the calculations of H. M. McConnell (AIEE Trans., 1954, 73, 1, 226) were used to compute the electric field intensity and the instantaneous value of the e.m.f. The measurement coils were wound differentially, and the plate tested was assumed to differ only slightly from a standard type. The e.m.f. difference was calculated for 4 variables: change in $\gamma$, B, plate width, and plate thickness. Two effects of the e.m.f. difference were used. The first was the degree of dependence of the e.m.f. on the parameters: a change in specific electroconductivity $\gamma$ and in B gave rise to a change of the e.m.f. difference proportional to the square root of $\omega$ (the angular frequency of the magnetic field) and to $H_m$ (magnetic field intensity at the plate surface), while a variation in the thickness of the plate caused a first order change. A more complex e.m.f. dependence arose from variations in the width of the plate (the first term was proportional to the first order in $\omega$ and $H_m$)while other terms depended on the square root of $\omega$ and $H_m$. The second effect was the change in the harmonic composition of the e.m.f. difference. The change in the physical properties and in the geometry of the plate affected the harmonic composition differently; the change of thickness affected only the first harmonic, but a change in electroconductivity, in magnetic induction saturation, and in width affected all harmonics. The individual parameters were measured on the basis of

Card 2/3

ACCESSION NR: AP4017352

these dependency differences, and several examples of individual measurements are given. Orig. art. has: 6 equations and 2 figures.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals, AN SSSR)

SUBMITTED: 25Apr63 ENCL: 00

SUB CODE: EM NO REF SOV: 001 OTHER: 001

Card 3/3

PLYUSNIN, V.G.; BABIN, Ye.P.; RODIGIN, N.M.; NASAKINA, M.I.

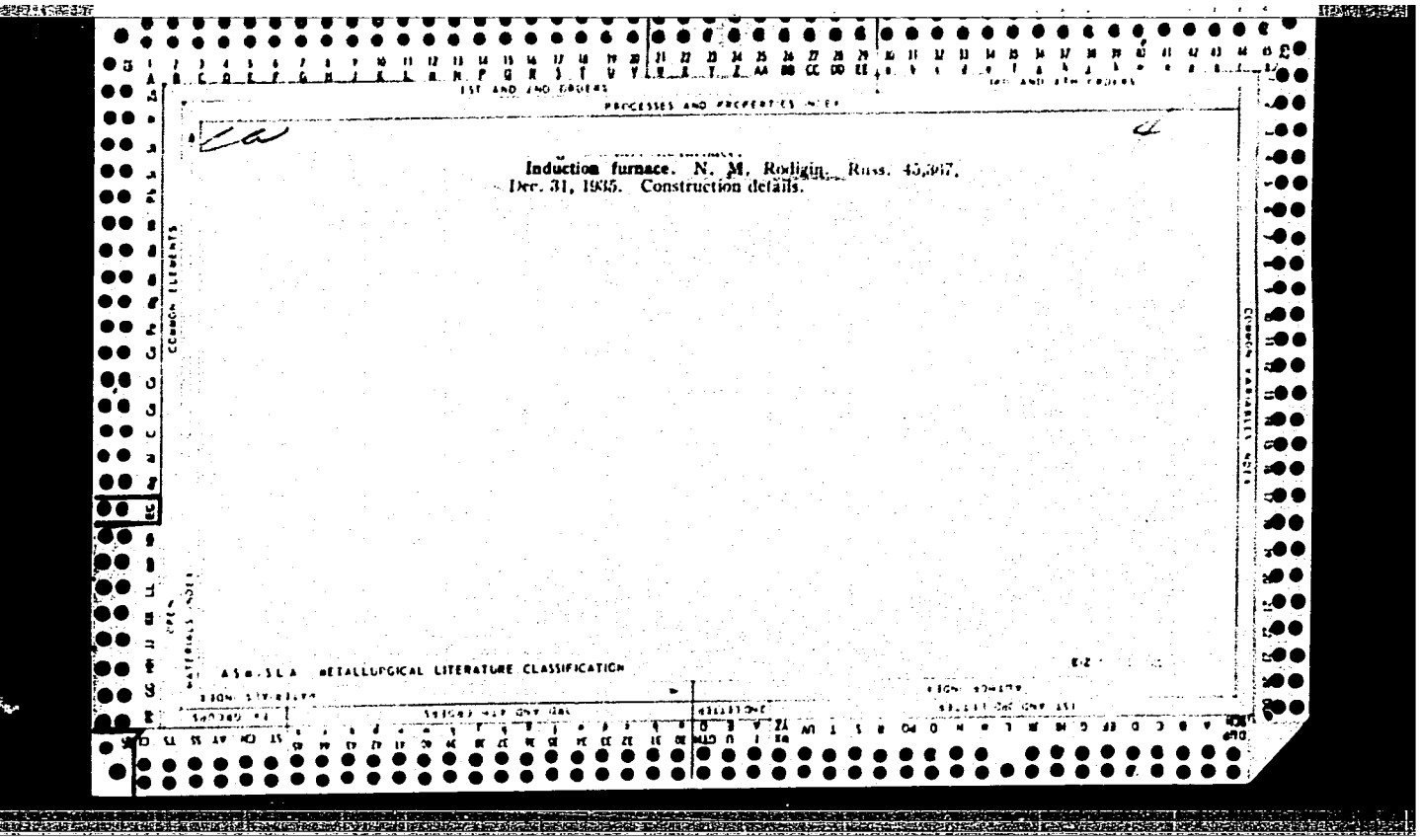
Regularities of the formation of isopropylbenzenes in the presence of aluminum chloride. Trudy Inst.khim. UFAN SSSR no.4:3-20 '60. (MIRA 16:6)

(Cumene) (Alkylation) (Aluminum chloride)

RODIGIN, M.N., doktor biolog. nauk, prof.

Studying the loose smut of wheat. Zashch. rast. ot vred. i bol. 6 no.10:53-54 O '61. (MIRA 16:6)

1. Saratovskiy sel'skokhozyaystvennyy institut.
(Wheat—Diseases and pests) (Smuts)



Induction furnace. N. M. Rodigin. Russ. 45,917, Dec. 31, 1935. Construction details.

SADOVSKIY, V. D.; PAVLOV, V. A. ; RODIGIN, N.M.

Temperature Measurements in Rapid Heating

Zav. Labor. 4, 430, 1941

RODICN, N. M.

Foucau's Currents in Cylindrical Bodies. Ural State University imeni Gorkiy, Sverdlovsk, 1945.

So: U-1837, 14 April 52.

RODIGIN, N. M.

Research on the Austenite Transformation in Steel Products

Trudy IMM UFAN 5, 40, 1945

RODIGIN, N. M.

Methodology of Laboratory Research on Electric Heat-Treatment of Steel

Trudy IFM UFAN 9, 3, 1946.

RODIGIN, N. M.; MALYSHEV, K. A.

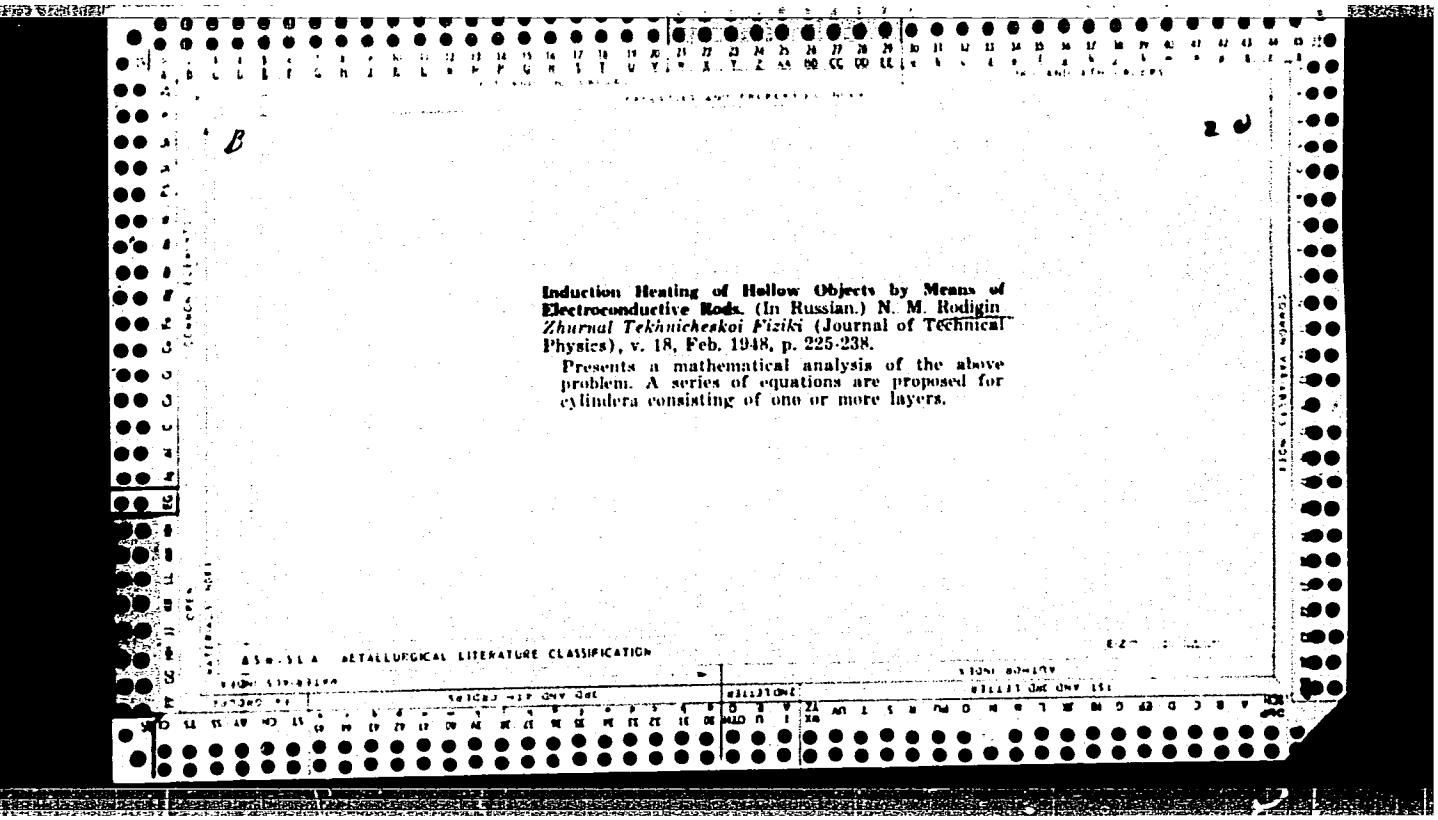
The Initial Temperature in the Growth of the Austenite Grain in Relation to the Rate of Heating

Trudy IFM UFAN 10, 53, 1946

[illegible], M. I.

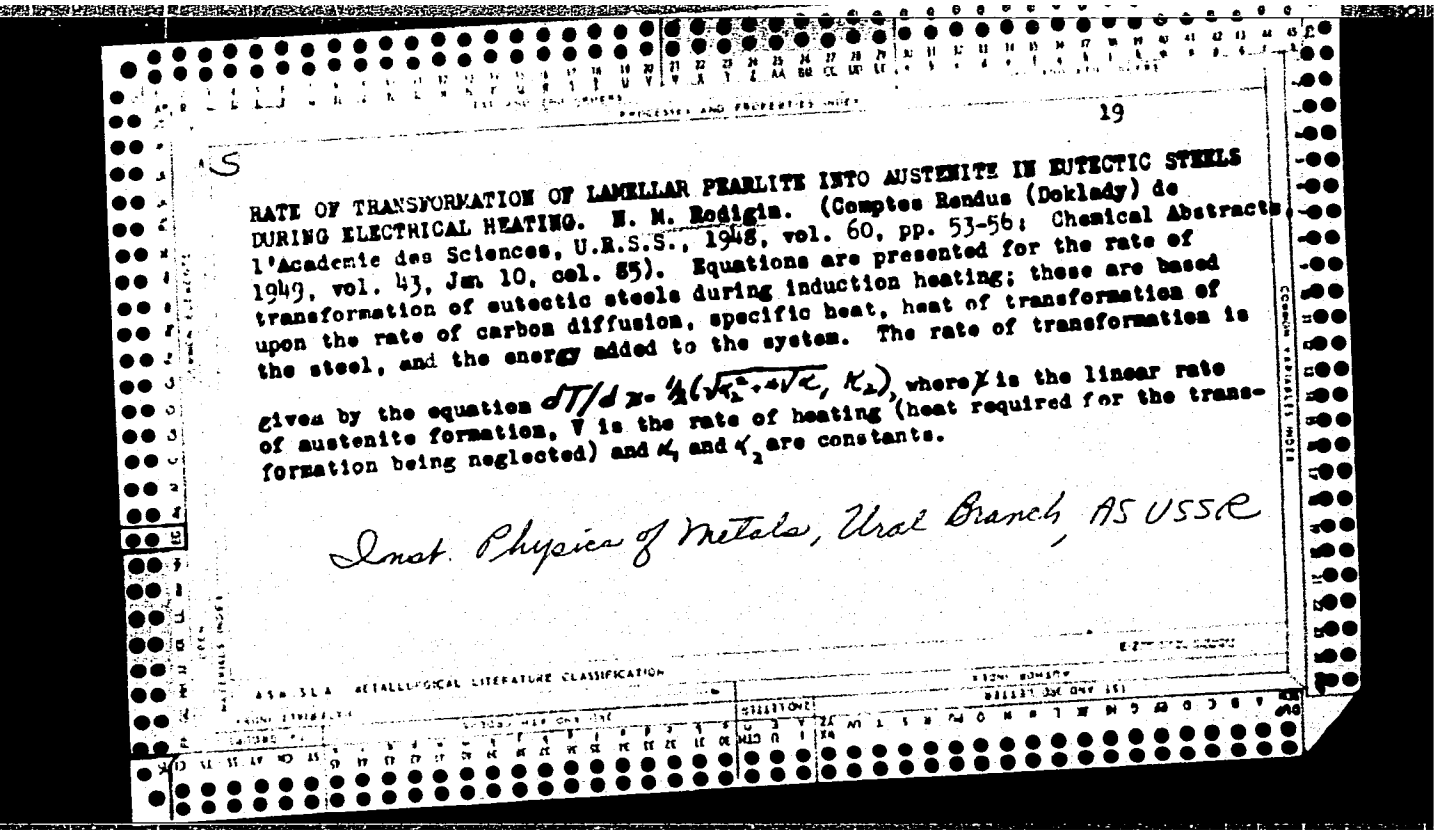
Sadovskiy, V. A., Rollgrin, N. M., and Porodina, N. A. "The influence of structural variations in steel on phase change in electric heating", Vestnik mashinostroyeniya, 1949, No. 12, p. 13-14, - Bibliog: 6 items.

SO: U-2888, 12 Feb. 53, (Letopis' Zhurnal 'nykh Statey, No. 2, 1949).



**Induction Heating of Hollow Objects by Means of Electroconductive Rods.** (In Russian.) N. M. Rodigin. *Zhurnal Tekhnicheskoi Fiziki* (Journal of Technical Physics), v. 18, Feb. 1948, p. 225-238.

Presents a mathematical analysis of the above problem. A series of equations are proposed for cylinders consisting of one or more layers.



19

RATE OF TRANSFORMATION OF LAMELLAR PEARLITE INTO AUSTENITE IN EUTECTIC STEELS DURING ELECTRICAL HEATING. N. M. Rodigin. (Comptes Rendus (Doklady) de l'Academie des Sciences, U.R.S.S., 1948, vol. 60, pp. 53-56; Chemical Abstracts 1949, vol. 43, Jan 10, col. 85). Equations are presented for the rate of transformation of eutectic steels during induction heating; these are based upon the rate of carbon diffusion, specific heat, heat of transformation of the steel, and the energy added to the system. The rate of transformation is given by the equation $dT/dx = \frac{1}{2}(\sqrt{\kappa_1^2 + 4V\kappa_2} - \kappa_1)$, where $x$ is the linear rate of austenite formation, V is the rate of heating (heat required for the transformation being neglected) and $\kappa_1$ and $\kappa_2$ are constants.

Inst. Physics of Metals, Ural Branch, AS USSR

RODIGIN, N. M.

Author: Rodigin, N. M.

Title: An induction method of preheating various steel items wit currents of normal frequency. (Induktsionnyi nagrev stal'nykh izdelii tokami normal'noi chastoty.) 246 p.

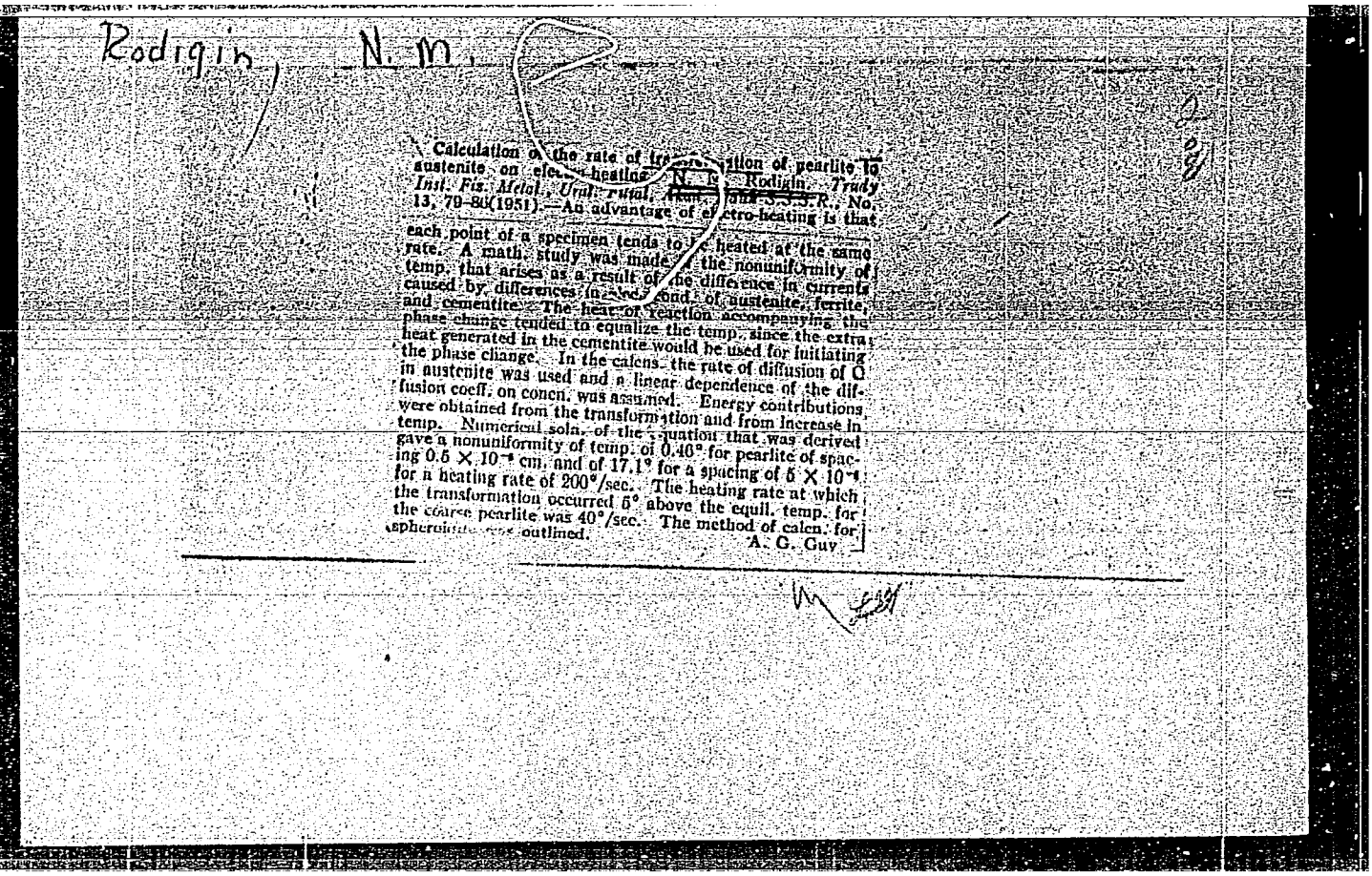
City: Sverdlovsk

Publication: State Printing House of Scientific and Technical Literature on Ferrous and Non-Ferrous Metallurgy.

Date: 1950

Available: Library of Congress

Source: Monthly List of Russian Accessions, Vol. 3, No. 8, Page 535



Rodigin, N. M.

Calculation of the rate of transformation of pearlite to austenite on electric heating. N. M. Rodigin. *Trudy Inst. Fiz. Metal. Ural. Filial Akad. Nauk S.S.S.R.*, No. 13, 79–86(1951).—An advantage of electro-heating is that each point of a specimen tends to be heated at the same rate. A math. study was made of the nonuniformity of temp. that arises as a result of the difference in currents caused by differences in the cond. of austenite, ferrite, and cementite. The heat of reaction accompanying the phase change tended to equalize the temp., since the extra heat generated in the cementite would be used for initiating the phase change. In the calcns. the rate of diffusion of C in austenite was used and a linear dependence of the diffusion coeff. on concn. was assumed. Energy contributions were obtained from the transformation and from increase in temp. Numerical solns. of the equation that was derived gave a nonuniformity of temp. of 0.40° for pearlite of spacing $0.5 \times 10^{-4}$ cm. and of 17.1° for a spacing of $5 \times 10^{-4}$ for a heating rate of 200°/sec. The heating rate at which the transformation occurred 5° above the equil. temp. for the coarse pearlite was 40°/sec. The method of calcn. for spheroidite was outlined.

A. G. Guy

[redacted], V. A.

Steel - Heat Treatment

Effect of structural non-uniformity of steel upon the phase transformations in heating by means of electricity. Trudy Inst. fiz. met. No. 13, 1951.

Monthly List of Russian Accessions, Library of Congress
June 1953. UNCL.

RODIGIN, N.M.

Induction heating with currents of industrial frequency.
[Izdaniia] LONITOMASH no.30:183-196 '52. (MLRA 8:1)
(Induction heating)

RODIGIN, N.M.; ALEKSEYEV, A.I.; DUGINA, N.A., tekhnicheskiy redaktor

[New method of preheating metal before welding] Novyi sposob podogreva metalla pered svarkoi. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1953. 27 p. (MLRA 7:8)
(Electric welding)

1. OLESOV, I. P., Eng.; ALEKSEYEV, A. I., Eng.; KODIGIN, N.M., Eng.

2. USSR (600)

4. Welding

7. Using induction preheating in assembly welding of steel structural units at temperatures below freezing, Stroi. prom., 31, No.1, 1953.

9. Monthly Lists of Russian Accessions, Library of Congress, April, 1953, Uncl.

RODIGIN, N.M.

"Problem of Perlite Transformation Into Austenite of Eutectic Steel"
Tr. In-ta Fiziki Metallov Uralsk. Fil. AN SSSR, No 14, 1954, 26-34

The formation of austenite in eutectic steel is studied while the heat source is located externally and the specimen emits heat. Equations are derived for isothermal transformation of perlite into austenite. These equations allow for determination of the C distribution in austenite for any instant, the duration of transformation, and the average speed of austenization front for an arbitrary tije time interval. (RZhFiz, No 11, 1955)

SOV/137-59-5-11265

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 255 (USSR)

AUTHOR: Rodigin, N.M.

TITLE: Induction Heating of a Moving Metal Strip

PERIODICAL: V sb.: Prom. primeneniye tokov vysokoy chastoty, Riga, 1957, pp 56 - 63

ABSTRACT: The author describes an induction apparatus for heating a moving metal strip in a transverse magnetic field. On each side of the strip, symmetrically to its plane, a magnetic conductor is located (made of transformer sheet steel) having a series of identical poles turned toward the strip. There is a coil on each pole through which a.c. current passes producing a magnetic field. The latter is directed perpendicularly to the strip plane. The author analyzes in detail the theory of induction heating. It is pointed out that the end temperature may be obtained over the entire length of a continuously moving strip only in the case if the total amount of heat liberated during the passing of the strip through the apparatus is equal for any point over the width of the strip. This

Card 1/2

depends entirely on the shape of the magnetic conductor. The apparatus design is simple. It is recommended to use audio frequency currents on devices for strip heating in a transverse magnetic field. In this case rotary generators and ionic frequency converters can be used. In individual cases it is possible to use power frequency current.

Z.F.

126-2-27/30

AUTHOR: Rodigin, N. M.

TITLE: Magnetisation of components by means of an A.C. current for defectoscopy and other purposes. (Namagnichivaniye izdeliy peremennym tokom dlya defektoskopii i drugikh tseley).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals and Metallurgy), Vol.IV, No.2, 1957, pp.377-378 (USSR).

ABSTRACT: In the case of an ordinary sinusoidal A. C. it is possible to select time intervals which correspond to a half cycle during which current will flow in one direction only. Magnetisation by means of current flowing during such half cycles is analogous to D.C. magnetisation and thereby a number of disadvantages of A.C. magnetisation can be eliminated. This idea is materialised in an instrument developed by the author of this paper in which the component is magnetised only during a quarter cycle when the A.C. line voltage changes between maximum and zero. The circuit consists of an ignitron, a thyratron, a peak value transformer and a condenser (Fig.1). The following advantages are claimed: the instrument ensures identical magnetisation (magnitude and polarity) of identical components; the magnetisation time of components is reduced (to a quarter cycle); the power consumption is reduced.

Card 1/2

Magnetisation of components by means of an A.C. current for defectoscopy and other purposes. (Cont.) 126-2-27/30

There is one figure and there are 4 Slavic references.

SUBMITTED: September 29, 1956.

ASSOCIATION: Institute of Metal Physics, Ural Branch, Ac.Sc. USSR. (Institut Fiziki Metallov Ural'skogo Filiala AN SSSR).

AVAILABLE:

Card 2/2

25(6) PHASE I BOOK EXPLOITATION SOV/2798

Rodigin, Nikolay Mikhaylovich, and Ida Yegorovna Korobeynikova Kontrol' kachestva izdeliy metodom vikhrevykh tokov (Use of Eddy Currents in Inspecting the Quality of Piece Parts) Moscow Mashgiz, 1958. 61 p. (Series: Obmen tekhnicheskim opytom) Errata slip inserted. 4,500 copies printed.

Reviewers: N. A. Krasyukov, Engineer, S. B. Shubina, Engineer and G. I. Alisionok, Engineer; Tech. Ed.: N. A. Dugina; Exec. Ed. (Ural-Siberian Division, Mashgiz): G. A. Sarafannikova.

PURPOSE: This book is intended for engineering and technical personnel engaged in inspection of parts and automation of production processes in the metalworking industry.

COVERAGE: This brochure discusses the physical basis of the eddy current method employed in the inspection of both full and hollow cylinder shaped piece parts. It describes oscilloscope circuits for simultaneous observation of two parameters and presents practical information on the design

Card 1/3

of instruments. No personalities are mentioned. There are 20 references: 7 Soviet, 7 German, and 6 English

TABLE OF CONTENTS:

AVAILABLE: Library of Congress (TS156 .Q3R63)

Card 3/3

JG/mmh
1-6-60

DUBITSKIY, Lev Grigor'yevich; RODIGIN, N.M., kand.fiziko-matem.nauk, red.; DUGINA, N.A., tekhn.red.

[Using radio measurements in product control] Radiotekhnicheskie metody kontrolia izdelii. Pod red. N.M.Rodigina. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1958. 223 p. (MIRA 12:3)

(Machinery industry--Quality control) (Radio measurements)

Rodigin . N.M.

PHASE I BOOK EXPLOITATION SOV/3847
SOV/26-8-8-20

Akademiya nauk SSSR. Ural'skiy filial. Institut fiziki metallov

Trudy, vyp. 20 (Transactions of the Physics of Metals, Ural Branch, Academy of Sciences USSR, No. 20) Sverdlovsk, 1958. 402 p. Errata slip inserted. 1,000 copies printed.

Resp. Eds.: S.V. Vonsovskiy, Corresponding Member, Academy of Sciences USSR, and V.I. Arkharov, Doctor of Technical Sciences.

PURPOSE: This book is intended for scientists working in the field of physical metallurgy.

COVERAGE: This is a collection of 28 articles written by members of the Institute of the Physics of Metals, Ural Branch of the Academy of Sciences USSR, on problems investigated at the Institute. Studies at the Institute have concentrated on two basic problems: 1) developing a theory of metals and alloys and finding ways to improve the properties of engineering materials; and 2) developing new physical methods for investigating and controlling the quality of materials and metal articles. In connection with these basic problems the articles in the collection treat the following subjects: problems of the multielectron quantum-mechanical theory of solids; the laws of distribution and diffusion of admixtures in various metallic alloys (internal absorption theory); strength and plasticity of polycrystalline materials in relation to interatomic binding forces, distortions in the crystal lattice; structural theory of diffusion reaction, i.e. diffusion due to chemical reactions in solid phases; theory of the magnetic structure of ferromagnetic substances; theory of the heat treatment of steel; and the physical theory of magnetic measurements (magnetic flaw detection and structural analysis). The first article gives a description of the work being done by the Institute and a list of departments and laboratories along with their chief personnel. Several persons are cited for their work at the Institute. References accompany each article.



AVAILABLE: Library of Congress (TN657.A4)

JA/gdz/lb
8-2-60

Card 6/6

SOV/126-6-2-18/34

AUTHOR: Rodigin, N. M.

TITLE: On the Influence of the Non-uniformity of the Electric Resistance of Steel on the Phase Transformation During Electric Heat Treatment (K voprosu o vliyanii neodnorodnosti stali po elektrosoprotivleniyu na fazovyye prevrashcheniya pri elektrotermoobrabotke)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 2, pp 315-320 (USSR)

ABSTRACT: Available information is discussed under the following chapter headings: comparison of electric heating with ordinary heating; features of heating of steel with micro-zones having non-uniform physical properties; influence of non-uniform heating (in the micro-volumes) on phase transformations; redistribution of the heat release during electric heat treatment. The results are summarised thus:

1. In addition to generating heat inside the component and high heating speeds, the features of electro-heat treatment manifest themselves in unequal liberation of heat in micro-volumes with differing specific electric resistance. The influence of this factor on the phase

Card 1/4

On the Influence of the Non-uniformity of the Electric Resistance of Steel on the Phase Transformation During Electric Heat Treatment

transformations will begin to assume a practical importance from a certain speed of heating, which depends on the structure of the steel.
2. The distribution of the heat during electric heating of steel depends on the shape and distribution of the micro-volumes with non-uniform specific electric resistance.
3. In the case of presence in steel of spheroidal carbide inclusions with a high specific resistance the heat liberated in these per unit of volume will be lower than in the base metal which has a lower specific resistance. The distribution of heat will be similar for other steels with a similar electric resistance of the structure.
4. The heat release per unit volume in sections of microscopic size in the form of a continuous network with high specific electric resistance will be larger than in the remaining metal having a lower specific resistance.
5. Non-uniform electric heating of various micro-sections due to volume changes brings about deformation and distortion of the crystal lattice or thermal work

On the Influence of the Non-uniformity of the Electric Resistance of Steel on the Phase Transformation During Electric Heat Treatment

hardening.

6. The non-uniform heating of the basic mass of the metal near to the carbide inclusions has a considerably smaller influence on the heat treatment than the basic effect of non-uniform heat release in the sections of one phase relative to that of another.

7. During formation of austenite, a continuous redistribution of the electric current and the heat takes place as a result of the local changes in the electric resistance.

8. Owing to non-uniformities of the composition and redistribution of the heat, non-uniform heating has an influence on the germination and the development of austenisation processes.

9. With increasing carbide globuli above a certain dimension the influence of the distortions in the crystal lattice or in the internal thermal hardening on the occurrence of germinations may be compensated by the

On the Influence of the Non-uniformity of the Electric Resistance of Steel on the Phase Transformation During Electric Heat Treatment

SOV/126-6-2-18/34

relative decrease in the dimensions of the boundaries. There are 3 Soviet references.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR (Institute of Metal Physics, Ural Branch of the Ac.Sc., USSR)

SUBMITTED: December 17, 1956

Card 4/4 1. Steel--Electrical properties 2. Steel--Transformations
3. Steel--Heat treatment

SOV/126-6-2-31/34

AUTHOR: Rodigin, N. M.

TITLE: Pulse Magnetization of Permanent Magnets (Impul'snoye namagnichivaniye postoyannykh magnitov)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol6, Nr 2, pp 368-369 (USSR)

ABSTRACT: A.c. is used for magnetization, using electronic switching; the magnetizing pulse lasts a quarter-period, and starts at the peak of the voltage wave. This makes the problem of interrupting the current easy; three or four pulses are used to produce saturation. As the pulse is brief a few turns of thick wire can be used to effect magnetization, which is very convenient. The largest magnets so magnetized had yoke cross-sectional areas of 15 $cm^2$. There are 2 references, both of which are Soviet.

ASSOCIATION: Institut fiziki metallov Ural'skogo filiala AN SSSR (Institute of Metal Physics, Ural Branch, Ac.Sc. USSR)

SUBMITTED: December 12, 1957

Card 1/1 1. Magnets--Preparation 2. Alternating current--Applications 3. Electronic switches--Applications

RODIGIN, N.M.

Achieving high rates of heating for the investigation of electric heat treatment and other purposes. Trudy Inst. fiz.mat. UFAN SSSR no.26: 349-354 '58. (MIRA 12:11)
(Thermoelectricity) (Electromotive force)

SOV/129-59-1-7/17

AUTHORS: Mironov, L.V., Engineer, Sazonov, V.G., Candidate of Technical Sciences, Levitin, V.V., Engineer and Rodigin, N.M., Candidate of Physico-mathematical Sciences

TITLE: Influence of Electric Heating on the Properties of Cold-rolled Stainless Steels (Vliyaniye elektronagreva na svoystva kholodnokatanykh nerzhaveyushchikh staley)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 1, pp 26 - 30 (USSR)

ABSTRACT: The influence was studied of electric annealing of the cold-rolled steels 1Kh18N9, 1Kh18N9T and Kh13N4G9 on their mechanical properties, the recrystallisation processes and the resistance of these steels against intercrystallite corrosion. The compositions and the main data of these steels are entered in Table 1, p 26. The specimens were heated with speeds of 100, 300, 600 and 1 000 °C/sec up to 900-1 400 °C and immediately after that were cooled in air. From thus-treated strips (20 x 200 mm), specimens for mechanical tests were prepared. The results of tensile tests are graphed in Figure 1, p 27 and it can be seen that the desired mechanical properties can be ensured by electric heating with speeds of 100 to 1 000 °C/sec without subsequent

Card1/3

Influence of Electric Heating on the Properties of Cold-rolled Stainless Steels

holding at the particular temperature. The optimum properties are obtained after heating to 1 150 - 1 200 °C. In Figure 2, p 28, microphotos are reproduced of the structure of the steel 1Kh18N9T after annealing with electric heating as well as with ordinary heating. On the basis of the results of investigations of the resistance of materials to intercrystallite corrosion, the authors conclude that the process of recrystallisation of cold-rolled austenitic stainless steels, under conditions pertaining to electric heating, proceeds with a very high speed but at a higher temperature than in the case of ordinary heating: softening and the desired mechanical properties of the steels 1Kh18N9, 1Kh18N9T and Kh13N4G9 at heating speeds of 100 - 1 000 °C/sec are attained at 1 150 - 1 200 °C. On the basis of corrosion studies, it is concluded that the necessary resistance against intercrystallite corrosion can be ensured with any of the investigated heating speeds for steels 1Kh18N9 and Kh13N4G9 and with heating speeds of 100 and 300 °C/sec in

Influence of Electric Heating on the Properties of Cold-rolled Stainless Steels

in the case of the steel 1Kh18N9T; if higher heating speeds are used, the carbon in this steel has to be combined first into titanium carbide.
There are 4 figures, 2 tables and 6 Soviet references.

ASSOCIATIONS: Ural'skiy institut chernykh metallov (Ural Institute of Ferrous Metals) and
Institut fiziki metallov UFAN (Institute of Physics of Metals of the Ural Branch of the Ac.Sc.)

SOV/180-59-1-21/29

AUTHORS: Izbranov, P.D., Pavlov, V.A. and Rodigin, N.M.(Sverdlovsk)

TITLE: Investigation of the Orientation of Recrystallization Centres at High Rates of Heating (Issledovaniye oriyentatsii tsentrov rekristallizatsii pri bol'shikh skorostyakh nagreva)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 1, pp 109-110 + 1 plate (USSR)

ABSTRACT: The authors suggest that more reliable results on recrystallization can be obtained through investigation of the orientation of centres at high heating rates than at the low rates used in most work. They go on to describe their investigation of the recrystallization of cold-rolled specimens of a 3.54% Si steel, One batch of test pieces was 75% reduced, the other by 95%. The 15x100x0.25 mm strip specimens were heated either by the passage of electricity, in Rodigin's apparatus (Ref 4), or by immersion in a hot salt bath and air cooled. The cold-deformed and recrystallized specimens were examined microscopically and their texture was determined by the X-ray method. Fig 1 shows the X-ray pattern obtained from a cold-deformed specimen, Fig 2 that from one

Card 1/3

Investigation of the Orientation of Recrystallization Centres at High Rates of Heating

recrystallized by heating electrically at 1100°C per sec. to 770°C, Fig 3 that from one immersed for about two seconds in a salt bath at 770°C. Fig 4 shows the structure obtained with the latter procedure. The X-ray patterns obtained with longer heating times in the salt bath are shown in Figs 5 and 6 (5 and 20 sec, respectively). The investigation showed that in recrystallization of strongly-deformed transformer steel (with a very pronounced deformation texture) the greatest probability of generation is possessed by those recrystallization centres whose orientation fully coincides with that of the deformed crystal sections. This leads to the first texture coinciding with the deformation texture. The second texture, which is that normally observed in the deformation of transformer steel, appears later in the development of recrystallization. The rates of heating

Investigation of the Orientation of Recrystallization Centres at High Rates of Heating

used had no appreciable effect on the mechanism of the formation of new grains on recrystallization.

There are 6 figures and 7 references, 5 of which are Soviet and 2 French.

SUBMITTED: August 7, 1958

Card 3/3

18(3), 18(7), 24(2) SOV/126-7-2-30/39

AUTHORS: Grigorov, K.V., Malyshev, K.A., Mironov, L.V., Rodigin, N.M. and Sazonov, B.G.

TITLE: On the Influence of the Speed of Heating on the Recrystallization Texture of Transformer Steel (O vliyanii skorosti nagreva na teksturu rekristallizatsii transformatornoy stali)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1959, Vol 7, Nr 2, pp 305-306 (USSR)

ABSTRACT: In conjunction with the development of a method of heat treatment of moving steel strip by induction heating, the authors of this paper investigated the kinetics of the processes taking place during rapid heating of cold-rolled strip of various grades: carbon, dynamo, transformer and stainless steels. It was established that re-crystallization and grain growth proceed at a very high speed. Thus, for instance, it is possible to effect recrystallization in less than 0.12 sec, including the heating time. This permits electric annealing of cold-rolled strip of the above mentioned grades, with the exception of transformer steel, at very high speeds

On the Influence of the Speed of Heating on the Recrystallization Texture of Transformer Steel

and short time durations, ensuring thereby all the properties specified by the GOST specifications. For cold-rolled transformer steel, the authors studied additionally the influence of the speed of heating on the degree of perfection of the texture and it is to this problem that the present paper is devoted. The investigations were carried out on industrially produced 0.5 and 0.35 mm thick strip with a Si content of 3.0 to 3.2%, produced by cold-rolling twice with an intermediate anneal at 800 to 850°C, whereby the relative reduction during each pass amounted to 50-60%. For the investigations the specimens were taken from melts intended for finished products with greatly differing properties. Heating of the specimens to 1000-1300°C was effected in an ordinary furnace and in a salt bath with various heating durations between 1 sec and 15 mins and also by direct passage of electric currents through the specimen. In all cases the specimens were cooled in air after heating. The heating speed varied between 1°C/min and 1000°C/sec. On the

On the Influence of the Speed of Heating on the Recrystallization Texture of Transformer Steel

basis of the obtained results the following conclusions were arrived at:

1. With increasing heating speed a continuous decrease occurs in the degree of perfection of the texture obtained at the respective temperatures. Holding at the respective heating temperature brings about a slight improvement of the degree of perfection of the texture. On heating with a speed of the order of 1°C/min, the degree of perfection of the texture reaches 95%, whilst on heating at a speed of 300 to 1000°C/sec it does not exceed 25-30%. The heating speed does not influence the type of texture: at all heating regimes the texture is characterized by the predominance of the orientation {110} and ⟨001⟩.

2. On heating at a speed of 300-1000°C/sec up to temperatures of 1000-1300°C, the grains grow to dimensions which are commensurate with the thickness of the sheet, consequently an increased heating speed does not suppress the grain growth generally but only the preferential

On the Influence of the Speed of Heating on the Recrystallization Texture of Transformer Steel

growth of grains which are orientated in a certain way. 3. What was said in paragraph 1 relates to melts which, under industrial conditions, yield a perfect structure and favourable magnetic properties. In specimens obtained from heats which yield poor magnetic properties, a relatively low degree of perfection of the texture is obtained for all heating regimes which, in the best case, does not exceed 50%; the type of texture of the specimens from heats of this group is also characterized by the fact that the predominant orientation of the grains is $\{110\}\langle 001\rangle$. As regards the processes of texture formation, slow heating of specimens obtained from such heats provides only insignificant advantages as compared to rapid heating. The problem of the influence of the speed of heating on the formation of recrystallization textures of cold-rolled materials has so far not been elucidated in literature. Assmus et al. (Ref 1) published certain data on the kinetics of the process of texture formation at various temperatures. Indirectly the results of these authors

On the Influence of the Speed of Heating on the Recrystallization Texture of Transformer Steel

are in agreement with the results given in this paper. There is one German reference.

(Note: This is a complete translation)

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics, Ac.Sc., USSR)

SUBMITTED: March 22, 1958

SOV/126-7-6-19/24

AUTHORS: Izbranov, P. D., Pavlov, V.A. and Rodigin, N.M.

TITLE: Some Peculiarities of the Recrystallization of Transformer Steel on Rapid Heating. 1. Dependence of Grain Size and Recrystallization Temperature on Rate of Heating

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 6, pp 915-921 (USSR)

ABSTRACT: It has been reported (Refs 2-6) that with electric heating the recrystallization process takes place very rapidly, e.g. in fractions of a second for cold-deformed steel heated rapidly (Refs 4-6). The object of the present work was to study this effect for transformer steel. The steel was supplied by the Verkh-Isetskiy Works, the composition being 0.08% C, 3.54% Si, 0.15% Mn, 0.018% S, 0.10% Cr. The 1 or 0.5 mm thick strip was cold-rolled to 0.25 mm, 15 x 100 mm plate test-pieces then being cut. Rapid heating was effected by direct passage of current in an installation as designed by N. M. Rodigin (Refs 13,14). A 0.1 mm thick nickel-nichrome thermocouple, welded to the specimen was used to measure temperature. Provision was made for maintaining the temperature, after rapid heating, constant. For slow-heating experiments, specimens were

Card 1/3

Some Peculiarities of the Recrystallization of Transformer Steel on Rapid Heating. 1. Dependence of Grain Size and Recrystallization Temperature on Rate of Heating

heated in an evacuated tube in an ordinary furnace. Micro-sections were prepared by electrolytic polishing and electrolytic etching (Ref 15). Fig 1 shows the relation between mean grain size and the logarithm of heating rate; micro-sections for specimens heated at 0.2 and 4250°C/sec are shown in Figs 2 and 3, respectively. The relation between recrystallization temperature and degree of deformation was also studied. For this specimens with 10, 25, 50, 75, 100 and 150% deformation were prepared, some of each group were rapidly heated to different temperatures and the volume of the recrystallized zone determined microscopically (Ref 18). Fig 4 shows the dependence of recrystallization temperature, and Fig 5 that of the difference between recrystallization temperature with rapid and slow heating, on degree of deformation. The authors conclude that as the heating rate increases, the grain size falls slightly (being only halved for a $10^4$-fold increase in heating rate). Recrystallization temperatures for rapid heating without soaking are higher

Some Peculiarities of the Recrystallization of Transformer Steel on Rapid Heating. 1. Dependence of Grain Size and Recrystallization Temperature on Rate of Heating

than for slow heating, the difference rising with increasing degree of deformation. When rapid heating is combined with soaking, the recrystallization temperature falls sharply to values lower than that obtained with slow heating. With heating rates up to about 5000°C/sec the state of the material (small extent of relaxation preceding recrystallization and the distribution of impurities), controlled recrystallization.
There are 5 figures and 18 references, 17 of which are Soviet and 1 French.

ASSOCIATIONS: Institut fiziki metallov AN SSSR (Institute of Metal Physics, Ac.Sc., USSR) and Sverdlovskiy gosudarstvennyy pedagogicheskiy institut (Sverdlovsk State Pedagogical Institute)

SUBMITTED: August 6, 1958

66233

SOV/126-8-3-17/33

18.1141, 18.7500

AUTHORS: Izbranov, P.D., Pavlov, V.A. and Rodigin, N.M.

TITLE: Some Peculiarities of Transformer-Steel Recrystallization During Rapid Heating. II. Kinetics of Texture Formation

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 3, pp 434-439 (USSR)

ABSTRACT: Much work (Ref 1 to 8) on recrystallization, particularly that of transformer steel, has been carried out on specimens subjected to isothermal recrystallization annealing for times occasionally as long as several hours. The object of the present work was to study the formation and development of the recrystallization texture of transformer steel at high heating rates. A steel with 3.54% Si with a reduction of 75 or 95% was used. 15 x 100 x 0.25 mm specimens were heated by an electric current without holding; others, 0.11 mm thick, by immersion in a salt bath at the required temperature. The electric heating was effected in the apparatus designed by N.M.Rodigin (Ref 10). The microstructure and texture of recrystallized specimens were studied, using a special camera, enabling the specimen to be displaced in two mutually perpendicular directions during exposure.

Card 1/3

66233

SOV/126-8-3-17/33

Some Peculiarities of Transformer-Steel Recrystallization During Rapid Heating. II. Kinetics of Texture Formation

X-Ray patterns obtained are shown in Figures 1 to 4 and 6 to 9, and the microstructure in Fig 5. The authors draw the following main conclusions. Two types of texture arise in the recrystallization of transformer steel. For the highly deformed material, the texture of the first stage of recrystallization conforms to the pronounced deformation texture; later this is replaced by the texture generally found in isothermal annealing of transformer steel. The heating rates (840 to 1170°C/sec) and current densities used had no appreciable effect on the mechanism of formation of new grains as regards orientation factors. The high recrystallization rates obtained by both methods of heating can be attributed to the considerable reduction in relaxation before recrystallization and, possibly, also to the redistribution of impurities. On rapid electric heating to temperatures over 1000°C, the texture produced is substantially the same as the recrystallization texture in isothermal

Card 2/3

66233

SOV/126-8-3-17/33

Some Peculiarities of Transformer-Steel Recrystallization During Rapid Heating. II. Kinetics of Texture Formation

annealing. There are 9 figures and 13 references, 8 of which are Soviet, 3 English and 2 French.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics AS USSR)
Sverdlovskiy pedagogicheskiy institut (Sverdlovsk Pedagogical Institute)

SUBMITTED: August 13, 1958

Card 3/3

18.1141
18.7500

67695
SOV/126-8-4-17/22

AUTHORS: Izbranov, P.D., Pavlov, V.A., and Rodigin, N.M.

TITLE: Some Peculiarities of Transformer Steel Recrystallization on Rapid Heating. III. Dependence of the Rate of Grain Growth and Activation Energy of this Growth on the Rate of Heating

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 4, pp 607-612 (USSR)

ABSTRACT: The high rates of recrystallixation of cold-deformed metals, particularly transformer steels on rapid heating has been explained (Refs 1, 2) in terms of a change in the condition of the metal before recrystallization. This should affect the rate and activation energy of grain growth and it was the object of the present work to determine these parameters for both rapid and slow heating of transformer steel and compare the results together and with published (Refs 3-6) work in this field. The steel used contained 0.08% carbon, 3.54% silicon, 0.15% manganese, 0.018% sulphur, and 0.10% chromium. For rapid-heating experiments the material is subjected to mechanical and heat treatment to give an average grain size of 2-3 mm and a reduced number of recrystallization

Card 1/3